HIGH PRESSURE DUCTWORK

A. ALL DUCTWORK CONNECTED TO PERIPHERAL AIR CONDITIONING UNIT SHALL BE FABRICATED AS FOLLOWS:

B. CIRCULAR DUCTWORK:

1. CIRCULAR DUCTWORK SHALL BE MADE OF 24 GAUGE ZING-GRIP GALVANIZED STEEL OF SPIRAL LOCKSEAM CONSTRUCTION. IT SHALL BE ASSEMBLED WITH PREFABRICATED FITTINGS MADE UP OF 20 GAUGE GALVANIZED IRON. JOINTS AT DUCT ENDS SHALL BE MADE WITH AN INTERIOR GALVANIZED IRON COUPLING WITH HEADED STOP, AND SEALED TIGHT WITH EC-800, OR AS APPROVED. WHERE AN INTERIOR COUPLING CANNOT BE USED, A DRAWBAND WITH MATCHED ANGLES SHALL BE USED ON THE EXTERIOR, BOLTED TOGETHER AND SEALED WITH EC-800, OR AS APPROVED. JOINTS SHALL, IN ADDITION, BE FASTENED WITH SELF-TAPPING SCREWS. HANGERS FOR HORIZONTAL DUCTS ARE TO BE 1 INCH x 1/8 INCH DRAWBANDS ON 8 FOOT 0 INCH MAXIMUM CENTERS.

C. RECTANGULAR DUCTWORK:

1. RECTANGULAR HIGH PRESSURE DUCTWORK SHALL BE FABRICATED OF BLOOM GALVANIZED IRON OF THE NO.16 U.S. STANDARD GAUGE.

2. ALL SEAMS SHALL BE MADE WITH PITTSBURGH LOCKS AND CALKED WITH EC-800 OR APPROVED, OR CONTINUOUSLY WELDED.

3. TRANSVERSE DUCT CONNECTIONS UP TO 90 INCH MAXIMUM DUCT DIMENSION, SHALL BE MADE WITH 1-1/2 INCH x 1-1/2 INCH x 1/8 INCH GALVANIZED IRON MATCHING ANGLE FLANGES. OVER 90 INCH MAXIMUM DIMENSION FLANGE ANGLES SHALL BE 2 INCH x 2 INCH x 1/8 INCH. ANGELS SHALL BE FULLY WELDED TO THE DUCTS COMPLETELY AROUND THE PERIPHERY OF THE DUCT TO PREVENT AIR LEAKAGE AND SHALL BE INSTALLED WITH 1/8 INCH THICK MINNESOTA MINING & MFG. Co. GASKET EC-1202. GASKETS SHALL HAVE OVERLAPPED CORNERS AND COVER ENTIRE FRAME. ANGLE BRACING SHALL BE SPOT OR TACK WELDED TO DUCTS. CONNECTING ANGLES SHALL BE BOLTED TO EACH OTHER WITH 1/4 IHCH x 3/4 INCH STOVE BOLTS, SPACED NOT MORE THAN 6 INCHES APART. IN ADDITION, EACH ANGLE FRAME SHALL BE ITSELF WELDED AT THE CORNERS FOR RIGIDITY.

4. ALL BRACING ON EACH OF FOUR SIDES ON RECTANGULAR HIGH PRESSURE DUCTS SHALL BE 1-1/2 INCH x 1-1/2 INCH x 1/8 INCH ANGLES AS FOLLOWS:

UP TO 60 INCHES	ON 2 FOOT 0 INCH CENTERS
OVER 60 INCHES	ON 2 FOOT 0 INCH CENTERS, PLUS A LONGITUDINAL ANGLE ON SIDES OVER 60 INCHES

ALL BRACING ANGLES SHALL BE TACK WELDED OR SPOT WELDED TO THE DUCTS.

D. THE LEAKAGE TESTING OF HIGH PRESSURE DUCTWORK SHALL COMPLY WITH THE FOLLOWING:

1. AFTER ALL DUCTWORK IS INSTALLED AND SYSTEM IS OPERABLE, LEAKAGE TESTING OF THE DUCTWORK INSTALLED SHALL BE PERFORMED.

2. TESTS SHALL BE MADE IN ACCORDANCE WITH SMACNA.

PIPE FITTINGS AND VALVES

A. FOR CHILLED WATER SERVICE IN THE 75th FLOOR MER:

1. FITTINGS 3" AND SMALLER SHALL BE MALLEABLE IRON THREADED, CLASS 300, IN ACCORDANCE WITH ANSI B 16.3. FITTINGS FOR ABOVE 3" SIZE SHALL BE BUTT WELD, STEEL SCHEDULE 40 AND IN ACCORDANCE WITH ANSI B 16.9, CLASS 300.

2. VALVES SHALL COMPLY WITH ANSI B 16.34, CLASS 300.

3. FOR CHILLED WATER, LOW PRESSURE STEAM, LOW PRESSURE RETURN AND DRAIN SERVICES IN THE 41st FLOOR MER REFER TO STANDARD SPECIFICATIONS.

PERIPHERAL AIR CONDITIONING UNIT

GENERAL

FURNISH AND INSTALL AIR HANDLING UNITS OF THE TYPE AND ARRANGEMENT AS SHOWN ON THE DRAWINGS. THE UNITS SHALL BE MANUFACTURED BY VIBRO-ACOUSTICS INC., AVANO INDUSTRIES, JACKSON & CHURCH, GOVERNAIR OR APPROVED EQUAL. MANUFACTURER SHALL HAVE SIMILAR EQUIPMENT INSTALLED FOR A MINIMUM OF 10 YEARS.

UNIT PERFORMANCE SHALL BE AS SHOWN ON THE EQUIPMENT SCHEDULE. THE UNIT EQUIPMENT MANUFACTURER SHALL SUBMIT CERTIFIED PERFORMANCE CURVES FOR EACH FAN AT THE RATED CAPACITY IN ACCORDANCE WITH AMCA STANDARD 210, ASHRAE STANDARD 51 AND ARI-430.

SUBMIT CERTIFIED SOUND POWER DATA FOR EACH AIR HANDLING UNIT AT THE UNIT INLET AND OUTLET. DATA SHALL BE REFERENCED AS SOUND POWER LEVEL TO THE 10-12 WATTS THROUGH EIGHT OCTAVE BANDS. SOUND POWER LEVELS SHALL BE OBTAINED FROM TESTS MADE IN ACCORDANCE WITH AMCA STANDARD 300.

THE GENERAL DESIGN OF EACH UNIT SHALL CONSIST OF UNPAINTED HEAVY DUTY GALVANIZED UNIT CASING. ALL PARTS OF THE AIR HANDLING UNIT MANUFACTURED OF UN-GALVANIZED BLACK STEEL INCLUDING ALL INTERIOR AND EXTERIOR PARTS OF THE FAN, CHANNEL BASE, DRAIN PAN AND OTHER BRACING SHALL BE COATED WITH A LEAD-FREE AND CHROMATE-FREE OXIDE ALKYD PRIMER.

UNITS SHALL BE TESTED IN ACCORDANCE WITH PORT AUTHORITY SPECIFICATION # 15855.

UNIT BASE

THE ENTIRE UNIT SHALL BE SUPPORTED ON ALL WELDED STRUCTURAL STEEL CHANNEL BASE AROUND THE COMPLETE PERIMETER OF EACH MAJOR SECTION. THE UNIT SHALL INCLUDE INTERMEDIATE CROSS MEMBER CHANNELS AS REQUIRED TO SUPPORT MAJOR COMPONENTS. PERIMETER CHANNELS SHALL BE 6", 8.2 LBS/FT. THE UNIT FLOOR SHALL BE 10 GAUGE PLATE WELDED TO THE STRUCTURAL STEEL CHANNEL BASE. THE UNDERSIDE OF THE FLOOR SHEET SHALL BE INSULATED WITH 2", 1-1/2 LBS/CU FT. FIBERGLASS INSULATION HELD IN PLACE WITH WELD PINS AND ADHESIVE. FLOOR INSULATION TO BE COVERED WITH A 16 GAUGE GALVANIZED STEEL SHEET WELDED TO THE BOTTOM OF THE CHANNEL BASE. PROVIDE HEAVY DUTY WELDED STEEL LIFTING LUGS AT THE CORNER OF EACH SHIPPING SECTION

COOLING COIL SECTION TO HAVE SLOPED STAINLESS STEEL DRAIN PAN WITH 2", 1-1/2 LBS/CU FT INSULATION AND COVERED WITH A 16 GAUGE GALVANIZED STEEL SHEET WELDED TO THE BOTTOM OF THE CHANNEL BASE. PAN SIDES ARE TO BE INSULATED WITH 2", 1-1/2 LBS/CU FT. FIBERGLASS INSULATION WITH STEEL COVER SHEET. EACH DRAIN PAN SECTION SHALL HAVE A 1-1/2" MPT DRAIN CONNECTION ON THE SIDE OF THE UNIT.

UNIT CASING

GALVANIZED PANELS

THE UNIT CASING SHALL BE 2" TONGUE AND GROOVE, DOUBLE WALL, OUTER CASING 14 GAUGE GALVANIZED STEEL CONSTRUCTION WITH 2", 3 LBS/CU FT INSULATION. THE UNIT CASING IS TO HAVE A MAXIMUM DEFLECTION OF 1/200 AT ITS OPERATING PRESSURE. PANEL CONNECTIONS TO BE JOINED WITH SELF TAPPING, SELF LOCKING ZINC PLATED MECHANICAL FASTENERS ON 12" CENTERS. ALL EXTERIOR SEAMS SHALL BE CAULKED WITH SILICONE SEALER TO PROVIDE AN AIRTIGHT SMOOTH SURFACE. THE INNER PANEL SHALL BE 20 GAUGE GALVANIZED STEEL. PERFORATED GALVANIZED STEEL INNER PANEL SHALL BE PROVIDED WHERE INDICATED ON THE DRAWINGS. THE UNIT SALL BE DESIGNED FOR A MAXIMUM AIR LEAKAGE RATE OF 1-1/2% OF THE TOTAL CAPACITY AT THE UNIT OPERATING PRESSURE.

CASING PANELS SHALL BE RATED FOR SOUND TRANSMISSION LOSS IN ACCORDANCE WITH ASTM E413-73 WHICH HAVE MINIMUM VALUES AS SHOWN:

OCTAVE BAND	2	3	4	5	6	7	STC
16GA/20GA PERF WITH 3 LB/FT3	21	29	38	47	56	55	35

GALVANIZED CASING PANEL SHALL BE G90 (0.90 OZ/FT2 TOTAL) HOT DIP PROCESSED ZING COATED GALVANIZED AND CONFORM TO ASTM 527.

SUPPORT STEEL SHALL BE PROVIDED AS REQUIRED - SUPPORT STEEL IS PRIME PAINTED.

ACCESS DOORS

PROVIDE A 2" THICK, DOUBLE WALL GALVANIZED STEEL INSULATED HEAVY DUTY ACCESS DOOR WITH A 10 GAUGE GALVANIZED FRAME AND FULL PERIMETER GASKETING. PROVIDE A MINIMUM OF TWO VENT LOCK 310 CAM LATCHES AND FULL LENGTH ZINC PLATED STEEL PIANO HINGE. PROVIDE A DOUBLE THICKNESS PLEXIGLASS DEADLITE. MINIMUM ACCESS DOOR SIZE SHALL BE 16"W X 66"H.

FAN SECTION

FURNISH BACKWARD INCLINED SUPPLY FANS AS INDICATED ON THE CONTRACT DRAWINGS. FANS SHALL BE ARR.3 DWDI CENTRIFUGAL TYPE HAVING NON-OVERLOADING HORSEPOWER CHARACTERISTIC. FANS ARE TO BE CONSTRUCTED OF STEEL AND COATED WITH A RUST-INHIBITING PRIMER PAINT.

THE WHEELS ARE TO BE ALL-WELDED CONSTRUCTION USING HIGH STRENGTH STEELS. BLADES ARE TO BE WELDED TO THE SPUN WHEEL FLANGE AND BACKPLATE. FAN WHEEL ASSEMBLY IS TO BE SECURED TO THE SHAFT WITH A KEY AND TWO SET SCREWS.

THE FAN SHAFT SHALL BE SOLID, COLD FINISHED STEEL, TURNED GROUND AND POLISHED. THE COMPLETE ASSEMBLY SHALL BE DESIGNED SO THAT THE FIRST CRITICAL SPEED IS AT LEAST 25% GREATER THEN THE DESIGN SPEED.

FAN BEARINGS SHALL HAVE A MINIMUM L-10 LIFE OF 80,000 HOURS AS DEFINED BY ASA AND THE ANTI-FRICTION BEARINGS MANUFACTURER'S ASSOCIATION. BEARINGS ARE TO BE FOOT MOUNTED AND DOUBLE ROW SPHERICAL ROLLER TYPE IN A SPLIT PILLOW BLOCK. BEARINGS SHALL BE RIGIDLY SUPPORTED ON STRUCTURAL STEEL SUPPORTS AND/OR BASES.

FAN HOUSINGS ARE TO BE CONSTRUCTED OF HEAVY GAUGE STEEL WITH SIDES AND SCROLL CONTINUOUSLY WELDED. HOUSING TO BE FITTED WITH A SPUN INLET CONE WHICH IS DESIGNED TO MATCH THE FAN WHEEL FLANGE FOR SMOOTH EFFICIENT AIR FLOW FROM THE FAN INLET TO THE FAN DISCHARGE AND FIXED INLET VANES. FAN HOUSING STRUCTURAL MEMBERS SHALL BE DESIGNED TO ALLOW REMOVAL OF FAN WHEEL, SHAFT AND BEARINGS WITHOUT DISTURBING THE STRUCTURAL INTEGRITY OF THE FAN HOUSING.

THE ENTIRE FAN ASSEMBLY IS TO BE FACTORY RUN TESTED AND DYNAMICALLY BALANCED TO NOT EXCEED 0.1 INCHES PER SECOND VELOCITY AS MEASURED ON AN IRD OR PMC ANALYZER.

THE FAN, MOTOR AND DRIVE ASSEMBLY SHALL BE INTEGRALLY MOUNTED ON A STRUCTURAL STEEL ISOLATION BASE WITH A 1" NOMINAL SPRING DEFLECTION. THE ISOLATORS SHALL BE INDIVIDUALLY SELECTED FOR EACH LOAD BEARING LOCATION TO MAINTAIN EQUAL DEFLECTION WITHOUT COMPENSATION. THE ISOLATION BASE SHALL BE PROVIDED WITH AN ADJUSTABLE NEMA MOTOR SLIDE BASE. THE FAN SHALL BE JOINED TO THE UNIT HOUSING BY A FIBERGLASS REINFORCED NEOPRENE COATED FLEXIBLE CONNECTION. THE ISOLATION BASE SHALL BE PROVIDED WITH ADEQUATE TIE-DOWN MECHANISMS TO PREVENT DAMAGE DURING SHIPMENT.

V-BELT DRIVE SELECTION SHALL MAINTAIN A MINIMUM SERVICE FACTOR OF 1.25 TIMES THE MOTOR HORSEPOWER. ADJUSTABLE DRIVES SHALL BE PROVIDED ON UNITS WITH MOTORS OF 15 HORSEPOWER AND LESS. FIXED PITCH DRIVES SHALL BE PROVIDED ON UNITS WITH MOTORS OF 20 HORSEPOWER AND GREATER. PROVIDE FACTORY MOUNTED V-BELT DRIVE GUARD WITH PERFORATED METAL SIDES, TACHOMETER HOLE, SPLIT DESIGN AND MEET OSHA STANDARDS.

FAN MOTORS ARE TO BE SIZED FOR 5% INCREASE IN FAN RPM WITHOUT OVERLOADING THE MOTOR.

COOLING COIL

ALL COOLING COILS SHALL BE SECURELY MOUNTED AND ENCASED WITH GALVANIZED STEEL BLANK-OFF SHEETS TO PREVENT AIR BYPASS. A 36" SLOPED DRAIN PAN, IN DIRECTION OF AIR FLOW, SHALL BE PROVIDED UNDER ALL COOLING SECTIONS. COIL SHALL BE REMOVABLE THROUGH THE UNIT CASING VIA BOLTED AND GASKETED PANELS. COIL REMOVAL SHALL NOT REQUIRE THE DISMANTLING OF UP STREAM OR DOWN STREAM COMPONENTS.

COOLING COILS SHALL BE RATED IN ACCORDANCE WITH ARI 410-81. COILS SHALL BE 5/8" OD, 0.035", WALL COPPER TUBE WITH HELICALLY WOUND 0.010" ALUMINUM FINS. HEADERS SHALL BE CARBON STEEL. COIL CASINGS SHALL BE A MINIMUM OF 16 GAUGE GALVANIZED STEEL. COILS SHALL BE DESIGNED FOR A WORKING PRESSURE OF 350 PSIG.

STEAM HEATING COILS

ALL HEATING COILS SHALL BE SECURELY MOUNTED AND ENCASED WITH GALVANIZED STEEL SHEETS TO PREVENT AIR BYPASS. COILS SHALL BE REMOVABLE THROUGH THE UNIT CASING VIA BOLTED AND GASKETING PANELS. COIL REMOVAL SHALL NOT REQUIRE THE DISMANTLING OF UP STREAM OR DOWN STREAM COMPONENTS.

HEATING COILS SHALL BE RATED IN ACCORDANCE WITH ARI 410-81 AND SHALL MEET THE SPECIFIED PERFORMANCE. COILS SHALL BE 1" OD 0.035", WALL COPPER TUBE WITH HELICALLY WOUND 0.010" ALUMINUM. HEADERS SHALL BE CARBON STEEL. COIL CASINGS SHALL BE A MINIMUM OF 16 GAUGE GALVANIZED STEEL. COILS SHALL BE DESIGNED FOR A MINIMUM WORKING PRESSURE OF 200 PSIG STEAM, 400°F AND BE FACTORY TESTED AT 250 PSIG AIR UNDER WATER.

FLAT FILTER BOX

THE UNIT SHALL BE FURNISHED WITH FLAT FILTER BOX CONTAINING PLEATED MEDIA ASHRAE 85% EFFICIENT FILTERS. FILTERS ARE TO BE SECURED IN GALVANIZED STEEL UNIVERSAL HOLDING FRAMES WITH APPROPRIATE HARDWARE.

ELBOW SILENCERS

A. GENERAL REQUIREMENTS

1. SILENCERS SHALL BE OF THE CAPACITY AND ACOUSTIC PERFORMANCE AS SHOWN ON THE CONTRACT DRAWINGS.

2. INSERTION LOSSES LISTED IN THE SCHEDULE ARE MINIMUMS; PRESSURE DROPS ARE MAXIMUMS ALLOWABLE. SILENCER PERFORMANCE, INCLUDING SILENCERS WITH FIBERGLASS CLOTH AND MYLAR ENCAPSULATED MEDIA SHALL BE TESTED IN ACCORDANCE WITH ASTM-E477 AND CERTIFIED WHEN SUBMITTED FOR APPROVAL.

3. ALL SILENCERS SHALL BE FACTORY FABRICATED AND SUPPLIED BY THE SAME MANUFACTURER. SILENCER INLET AND OUTLET DIMENSIONS MUST BE EQUAL TO DUCT SIZES SHOWN ON THE DRAWINGS. DUCT TRANSITIONS AT SILENCERS ARE NOT PERMITTED UNLESS SHOWN ON THE DRAWINGS. A SHEET METAL ELBOW IN COMBINATION WITH A RECTANGULAR SILENCER IS NOT ACCEPTABLE AS AN ELBOW SILENCER.

4. SILENCERS SHALL BE PROVIDED BY ONE OF FOLLOWING MANUFACTURERS OR APPROVED EQUAL:

a. VIBRO-ACOUSTICS
b. INDUSTRIAL ACOUSTIC
c. UNITED McGILL.

O. CONSTRUCTION

1. ALL ELBOWS SILENCERS SHALL BE CONSTRUCTED WITH AN 18 GAUGE GALVANIZED OUTER CASING AND A 22 GAUGE GALVANIZED PERFORATED STEEL. ALL PERFORATED STEEL SHALL BE ADEQUATELY STIFFENED TO INSURE FLATNESS AND FORM. ALL SEAMS AND JOINTS SHALL BE MASTIC SEALED TO INSURE AIRTIGHT CONSTRUCTION.

2. MEDIA SHALL BE INCOMBUSTIBLE ACOUSTIC QUALITY, SHOT-FREE FIBERGLASS INSULATION WITH LONG, RESILIENT FIBERS BONDED WITH A THERMOSETTING RESIN. DENSITY SHALL BE AS REQUIRED TO INSURE CONFORMANCE WITH LABORATORY TEST DATA. FIBERGLASS SHALL BE PACKED WITH A MINIMUM OF 10% COMPRESSION DURING SILENCER ASSEMBLY. MEDIA SHALL BE BACTERIA AND FUNGUS RESISTANT, RESILIENT SUCH THAT IT WILL NOT CRUMBLE OR BREAK, AND CONFORM TO IRREGULAR SURFACES.

FIRE/SMOKE DAMPERS

A. PROVIDE FIRE/SMOKE DAMPERS WHERE INDICATED

B. DAMPERS SHALL MEET UL STANDARDS AND SHALL BE IN ACCORDANCE WITH TEMPERATURE AND LEAKAGE CLASSIFICATION UL-555S, HAVING 1-1/2 HOUR FIRE RATING.

C. MAXIMUM LEAKAGE THRU DAMPERS SHALL BE 4 CFM PER SQ. FT. AT 1"W.G. (CLASSIFICATION I) AND TESTED AT 4"W.G. WITH LEAKAGE NOT EXCEEDING TWICE THE LEAKAGE AT 1"W.G. DURING THE TEST.

D. DAMPER OPERATORS SHALL BE RATED AT 350°F. IN ACCORDANCE WITH UL-555S. MOTORS SHALL BE 110V. ELECTRIC TYPE AND INSTALLED OUTSIDE OF THE AIR STREAM.

FILE NAME: CONTROLLING SCALE FACTOR 1=8